

What is claimed is:

1. An antenna with built-in filter comprising:

a laminated dielectric block that is formed such that dielectric sheets each having a conductive film formed on one
5 surface are laminated so as to constitute at least one filter;

a radiation element fixedly provided at the laminated dielectric block and electrically connected to one electrode of the filter; and

a feeding terminal electrode electrically connected to
10 the other electrode of the filter and provided at the outer face of the laminated dielectric block,

wherein the feeding terminal electrode is provided on a mounting face that is a face opposing to a circuit board when the laminated dielectric block is mounted on the circuit
15 board and a connecting wiring for connecting the other electrode of the filter and the feeding terminal electrode is not exposed to the outer face other than the mounting face of the laminated dielectric block.

2. The antenna with built-in filter of claim 1, wherein
20 the electrical connection between the other electrode of the filter and the feeding terminal electrode is performed through a via-contact composed of a conductor embedded into a contact hole provided on a dielectric sheet.

3. The antenna with built-in filter of claim 2, wherein
25 the via-contact is divided into two or more via-contacts at a different position on a plane view position of the dielectric block, and the two or more via-contacts are

connected through a wiring provided on a dielectric sheet that constitute the dielectric block.

4. The antenna with built-in filter of claim 2, wherein the via-contact is formed into a band shape by embedding the
5 conductor into a slender and groove-like contact hole provided on a dielectric sheet so as to increase the cross section of the via-contact.

5. The antenna with built-in filter of claim 1, wherein the filter comprises a filter group including at least two
10 of a low-pass filter, a high-pass filter and a band elimination filter.

6. The antenna with built-in filter of claim 1, wherein the radiation element is formed so as to be capable of receiving or transmitting two or more frequency bands, and tow or more
15 filters are formed so as to be capable of receiving or transmitting signals of the two or more frequency bands.

7. The antenna with built-in filter of claim 6, wherein one of the two or more filters comprises a band elimination filter for eliminating a frequency band of a signal that is
20 received or transmitted by the other filter of the two or more filters.

8. The antenna with built-in filter of claim 6, wherein the two or more frequency bands received or transmitted by the radiation element comprise at least two of a frequency
25 bands for cellular, a frequency band for GPS and a frequency band for Bluetooth.

9. The antenna with built-in filter of claim 6, wherein

two or more filters are shielded not so as to interfere with each other by forming a shielding wall in a vertical direction in dielectric sheets of the laminated dielectric block, the shielding wall being formed by a band-like via-contact
5 provided in the dielectric sheets.

10. A mounting structure of an antenna with built-in filter comprising:

the antenna with built-in filter of claim 1; and

a circuit board which has laminated structure including
10 at least a shielding layer and a wiring layer, on which the antenna is mounted,

wherein the feeding terminal electrode is electrically connected to an internal wiring provided in the circuit board and an electronic device provided on a surface of the circuit
15 board is electrically connected to the feeding terminal electrode via the internal wiring.